Dissertation

Master in Finance

Changes in Dividend Policies after PE Investment in the European Market

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Abstract

Private Equity has been a recent and popular phenomenon all around the world, especially since the 1980s.

Although there are many studies referring to changes within the company, something that was never (to our knowledge) studied before was how dividend policies would change after the buyout.

This study developed a model to analyse the 3 years before and after the buyout on a sample of European countries from the period 2010-2013, taken from Zephyr. We compare how dividends change with the investment of a PE firm, controlling for variables like Size, Capital Structure, CAPEX and Profitability, using methods such as OLS regression, the T-test and Wilcoxon signed rank test to reach our conclusions on the subject.

Resumo

Private Equity é um fenómeno relativamente recente em todo o mundo, tendo começado a ganhar cada vez mais importância a partir dos anos 1980.

Embora existam vários estudos que analisam o que acontece dentro da empresa e que mudanças lhe estão associadas depois do *buyout*, algo que nunca foi estudado (que tenhamos conhecimento) foi como as políticas de dividendos alteravam depois da entrada.

Este estudo baseia-se no desenvolvimento de um modelo que permite analisar os 3 anos antes e depois do *buyout* e perceber como os dividendos alteram e que efeitos variáveis como o tamanho da empresa, a estrutura de capitais, as despesas de capital e a rentabilidade terão. A amostra de *buyouts* em países europeus de 2010-2013 foi retirada do Zephyr, com os dados posteriormente recolhidos da base de dados Amadeus. Para obter os resultados, utilizámos métodos como o OLS, os testes T e o *Wilcoxon signed rank test*.

List of abbreviations

PE - Private Equity

RE - Retained Earnings

TE - Total Equity

TA - Total Assets

LBO - Leveraged Buy-outs

EBITDA - Earnings before Interests, Taxes, Depreciations and Amortizations

CAPEX - Capital Expenditures

FCF- Free Cash-Flow

OSF – Other shareholder Funds

ROA – Return on Assets

ROE – Return on Equity

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1. Introduction

The goal of this dissertation will be to analyse how dividend policies change when a company is invested by a Private Equity Firm, in the European market.

Private Equity market is sort of a recent phenomenon that started mainly in the 1980s in the U.S. and, although a slight decrease in the 1990s, came back strongly in the 2000s, spreading worldwide. Many studies have been conducted to understand what kind of changes these investments bring to the target companies, how is their situation after the divestment and also how do they compare with similar firms in the industry. The literature seems to agree that, mainly in the 1980s, there is evidence of value creation mainly due to operational improvements; however, factors like leverage have also been proved to be very significant in explaining the created value. But one gap that we found in the literature is about how dividends are affected by the buyouts, and that is the topic we pretend to research.

Dividend policies have been studied throughout the years, but these studies are still not entirely conclusive – most research, like Fischer Black (1976), tried to understand the dividend puzzle, that will be thoroughly explained in the literature review. This puzzle centres on the question "why do firms pay dividends?", and there are theories that defend that they are irrelevant, destroy or create value for the shareholders. Despite this, evidence seems to agree that dividends, although not creating value, do not seem to harm both the company and shareholders; there are even some investors that prefer dividend-paying shares.

We believe this topic will be interesting to develop, since Private Equity firms invest in companies with the main purpose of raising money for their investors, either by raising dividends or by investing and improving the company, in order for the Equity values of the company to be higher and to be able to sell it for a higher value; it will be interesting to study if the companies prefer then to give money to their investors early in the process or save in order to get a higher sale price. This is what we intend to test in this dissertation, by analysing the three years before and after the investment on a sample of buyouts from Europe from the period 2010-2013.

2. Literature Review

2.1. Private Equity and the main impacts after the buyout

There have been many discussions between researchers about the creation of value by Private Equity firms. Jensen (1989) argues that PE firms apply financial, governance and operational engineering to their portfolio companies, thus creating value. Other critics, on the contrary, believe PE firms take advantage of tax breaks and superior information, but do not create any operational value.

Kaplan et al. (2009) state that PE firms, as Jensen (1989) said, apply three sets of changes in the firms, which they too categorize as financial, governance and operational engineering.

Jensen (1989) and Kaplan (1989) describe financial and governance engineering change associated with three main factors:

- Management incentives in their portfolio companies, as managers have usually a large Equity upside through stock and options. Kaplan (1989) refers to a management ownership increase by a factor of four in going from public to private ownership.
- Leverage, that we will discuss forward.
- Control of PE investors on the boards, as they are more actively involved in governance than public boards.

Along with these, factors on an operational level such as the operating performance (discussed further) and employment are considered to be the most important ones. As for employment, evidence suggests we cannot assume the theory that PE destroys jobs. From studies from the US - Kaplan (1989), Davis et al. (2011) and Lichtenberg et al. (1990) – we see that employment grows after the buyout, despite not as much as with other companies. From the UK - Amess et al. (2007) – we get same employment growth rate, but slower in terms of wages. Finally, from France – Boucly et al. (2008) – we have an exception, as the authors found greater job and wages growth.

Asymmetric information could also be considered, but evidence suggests there is not an important role for firm-specific information - Acharya et al. (2011), Kaplan (1989).

2.1.1. Operating Performance

Most of the research about benefits to the operational performance of target companies of a PE investment is frankly positive. Kaplan (1989), for a sample of U.S. public-to-private deals in the 1980s, finds evidence of this, by increases in ratios like operating income to sales and cash-flow to sales and decreases in CAPEX to sales. Smith (1990) finds similar results.

As for Europe, the results are consistent to the U.S. in the 1980s, work that includes studies by Harris et al. (2005) for the United Kingdom, between 1994 and 1998; Boucly et al. (2008) for France, in the period 1994-2004; and Bergström et al. (2007) for Sweden, from 1998 to the first half of 2006.

But there are some different findings, more concretely in more recent public-to-private transactions. Guo et al. (2011) found modest increases in operating and cash flow margins that are much smaller than those found in the 1980s data for the United States and in the European data, by analysing a sample of U.S public-to-private transactions from 1990 to 2006. Weir et al. (2008), for a UK sample in 1998-2004 and Mendes (2011), for a Portuguese sample in the period 1996-2010 find similarly modest operating improvements; in the Portuguese market case, although there is an increase in sales and assets, the operating performance was considered poor, even in relation to the industry, especially due to a decrease in EBITDA and CAPEX. However, Guo et al. (2011) also found high investor returns, which can signify a difference between these transactions and the 1980s ones.

In summary there seems to be evidence supporting the existence of operating improvements. Nonetheless, this last wave of PE transactions achieves some different results, which would be an interesting topic for discussion in the future.

2.1.2. Leverage

Leverage, representative of the financial engineering value driver, is considered by Berg et al. (2003) as important to the creation of value, by optimizing the capital structure and minimizing the after-tax of capital of the portfolio company.

Some explanations are given as to why companies increase their debt after investment from a PE firm. For starters, there is the tax effect, mainly considered by Kaplan (1989), in a sample of U.S. management buyouts in the period 1980-1986; the study refers some tax benefits due to increase leverage, while stating the difficulty on

reaching an optimal level. Opler et al. (1993) add to this, proving LBO firms use more debt than needed to eliminate taxes, which means that the role of debt is also related with another factor, the FCF. This is also analysed by Jensen (1986, 1989), who states the use of debt in buyouts facilitates a reduction of available FCF and enforces managers to attend debt payments rather than spend it inefficiently.

Other studies about leverage, like the one from Palepu (1990), try to explain the better performance of equity in buyout transactions and lower risks – he shows that although the financial risk increases, the business risk decreases at the same time. Achleitner et al. (2010) and Acharya et al. (2013) explain that some of the created value in these operations is explained by debt, referring also that the debt-to-equity ratios decrease in both samples.

In summary, debt seems to be an important factor in the value creation process, and companies even tend to reduce their debt-to-equity ratios, like these last two studies stated.

2.2. Dividend Policies

2.2.1. The Dividend Puzzle

Why do companies pay dividends? This question has been asked for a long time, and scholars and researchers everywhere have tried to answer it, but still there is not a perfect one.

To start explaining the Dividend Puzzle, it is important to understand what kind of value dividends have for both managers and shareholders. According to the model developed by Miller and Modigliani (1961), in a perfect capital market, without frictions, the existence of a dividend policy would be completely irrelevant. This happens as the stock that pays dividends will decrease its value, compared to one that does not pay: if the stock is valued at 40€ and pays dividend of 4€, the next day its share price would decrease to 36€.

But the world we live in does not work that way. The markets are not perfect, and there are some frictions that should be taken into consideration. Black (1976) tries to explain this, by introducing taxes into the equation. Normally taxes are higher for

dividends than for capital gains, and the first ones are not deductible. In light of this, it is safe to assume that investors are not indifferent anymore to dividend payments, rather preferring to not receiving dividends at all.

So, do dividends destroy value? Black (1976) introduces transaction costs, saying that it could be a factor for investors preferring shares that pay dividends; however, he immediately rejects it, since corporations that do not pay dividends can easily arrange for automatic share repurchase plan, making this argument quite ineffective to explain why companies pay dividends.

Black (1976) continues his argument, saying that dividend payments can contain information about the company – the Signalling Theory. Managers do not usually like to change dividends, so they will only increase them if their prospects for the future of the company are good enough to support this decision in the next year. In the same way, they will only cut on dividend payments if their prospects for a quick recover are poor. In result, if the company cuts its dividend payments, its stock price would naturally fall. However, if the dividend changes are not due to forecasts of the company's prospects (for example, if it just wants to save taxes for its shareholders), the stock price would eventually go back to the level they were. Thus, even though dividends have a signalling value, the argument is not that strong to explain why companies pay dividends.

He continues to try to give more explanations to this phenomenon. Some may argue that dividends can be used in the trade-off between shareholders and creditors, as a euro that is spend in dividends is a euro that is not available to the creditors if trouble develops. But since the company can negotiate with the creditors to not pay dividends for better conditions, the argument is also pretty weak. On the other hand, not paying dividends is a low-cost way to raise money for future investment projects. So why do companies still pay dividends?

We have then the dividend puzzle presented. If we take some of the factors, like the tax implications, the fact the money can be used for alternative investments, and that they can negotiate not paying dividends with creditors for better conditions, it would seem that it would be better for companies to reduce their dividend payments or not having them at all. Apple, for example, does not pay dividends and is still considered a good company to invest as its share price continues to increase. However, considering their signalling value, the transaction costs and the trade-off between shareholders and

creditors, it appears that paying dividends can be also beneficial for the company. So why do some companies pay dividends and others do not?

Let us take into consideration Baker et al. (2002), who revisited the problem raised by Black (1976). They reached the conclusion that there are imperfections in the market that affect firms differently, depending on factors such as sector, time, shareholder structure, which makes it impossible to create a model that mathematically fits all firms at all times. This agrees with Fama et al. (1968), whose study used a new methodology for the time based on the Lintner model, who found consistent evidence on dividend models for individual firms, by analysing a sample of 392 companies from the period 1946-64.

2.2.2. Key Factors to explain dividend policies

In order to then understand what factors can influence an individual firm in their dividend policy, Baker et al. (2002) divided them in 4 key factors: Market imperfections/frictions, behavioural considerations, firm characteristics and managerial preferences.

a) Market imperfections/frictions

Starting with the market imperfections, the authors refer to taxes, asymmetric information, agency and transaction costs.

For taxes, as we previously analysed in the dividend puzzle, are usually higher for dividends than for capital gains, so we could assume that investors would prefer non-paying dividend stock, at least those with high tax bracket. But some research tells us that this is not what really happens, especially considering firstly Bernheim (1990), which concludes companies still pay dividends when taxes are high; it also goes accordingly with Black (1976), by saying that share repurchases are stimulated by higher dividend taxation, being a less tax heavy solution. These share repurchases are, as we previously stated, one of the alternatives for the transaction costs not paying dividend shares represent.

We have also to encompass here the Clientele effect, although being a more behavioural aspect: for example, a tax exempt investor would prefer a higher dividend paying stock, especially for its liquidity. However, Black et al. (1974) concluded that, by analysing a sample of monthly data on dividends, prices, and returns for every

common stock listed on the New York Stock Exchange at any time in the period January 1926 to March 1966, the effects of dividend yields on expected returns of a portfolio are almost null, for both tax exempt and high tax bracket investors, which would lead the focus on each kind of dividend yield (high or low paying) to an increased risk portfolio with the same expected returns.

It is important also to consider Jacob et al. (2014), who found a relation between dividend taxation and ownership structure, by analysing corporate tax returns of all Swedish closely held corporations over the period 2000–2009; it concluded that the taxation impact on dividend pay-out is higher when the number of owners is smaller.

We also have, leaving the perfect market from Miller (1961), asymmetries of information between shareholders and managers. As managers prefer to keep dividend policies stable, a change in dividend payments would have a signalling value for shareholders, as managers would only increase them if in fact they were certain of the sustainability of that dividend policy in the future; and would only decrease them if they did not believe in a quick recover from the company.

Researching the literature on the subject, we see that Bhattacharya (1979) watches dividends working as a signal; Bernheim (1990) also finds evidence that stock price tends to rise in response to an announcement of dividend increase. A study of event announcements in the Cyprus market – this market has some unique features, like the fact most companies have a highly concentrated ownership structure and the lack of transparency – by Travlos, Trigeorgis and Vafeas (2015) also found evidence of positive impact of dividends on stock markets, which it attributes mostly to Signalling Theory (other explanations are related to reducing exploitations by big shareholders to smaller ones).

However, we have to take into consideration the study by Black and Scholes (1974), that concludes that changes in dividend policy do not have a permanent effect on stock price; this goes accordingly with Black (1974) – the signalling property of dividends, although being a real factor, has more of a short term effect, since its effects do not last in time (considering the decrease in dividends is just for a different reason, like saving for an investment project).

Agency costs are also referred in Jensen (1986), as a dividend increase will control management, since shareholders do not approve the excess of free cash-flows made available to managers, as a result of little dividend distribution.

b) Behavioural considerations

As stated before, evidence suggests that it is not possible to establish a mathematical model working for all firms at all times, and behavioural aspects are one of the main reasons. Companies have different managers and shareholders, with different ways of thinking, so what works for one may not work for the other the same way. Investors' preferences need to be taken into consideration to establish a dividend policy, and most of the studies on the matter are related to their rationality. As we discussed previously, there seems to be no evidence that dividends create or destroy value for the company. However, some investors prefer dividend paying shares while others prefer companies not to distribute funds that could be used in other investment projects. We can turn to the "Bird in the Hand" explanation – investors prefer to receive dividends instead of waiting for the possible increase or decrease of the share price of a non-dividend paying one. The clientele effect is also important to consider in this topic, as some investors will indeed prefer dividends opposed to capital gains – particularly if they are tax exempt.

As the literature goes, Bhattacharya (1979), by assuming that outside investors have imperfect information about firms' profitability and that cash dividends are taxed at a higher rate than capital gains, considers the "Bird in the Hand" effect as a fallacy; Hamza et al. (2017), by studying companies in the technology sector in the NYSE and AMEX between 2010 and 2014, registered evidence that investors prefer capital gains to dividend payments. But maybe the most concluding study about rationality comes from Breuer et al. (2014), who tried to analyse cross-country differences in dividend policies by behavioural patterns. Their sample was composed of 43.000 firm-years from 29 countries; the behavioural variables were registered via a comprehensive survey. They registered the positive effect of loss and ambiguity aversion of the investors with dividends, and concluded that more patient and rational investors preferred low dividends.

Other important test to refer is the one by Desmukh et al. (2013), in a possible relation between CEO overconfidence and dividend payments – they consider a CEO overconfident if they overinvest personal funds in their personal company. They found evidence that overconfident CEOs pay lower dividends, as they perceive external funding as more costly, in their sample of US companies mentioned in Forbes' largest

over 1984-94. They also believe dividends provide information about CEO's overconfidence, due to the effects caused by them on stock markets.

c) Firm characteristics

The firm characteristics are also important to assess the dividend policy: the authors consider profitability, size, investment opportunities and anticipated future earnings, among others.

In this topic is important to refer the Life-cycle theory, that states dividend payments are a function of the company's life cycle – dividend payments would increase as the company matures, reaching higher payments both in maturity and decline phases. Many authors tried to study this phenomenon, with positive results: a test on this theory by DeAngelo et al. (2006), with a sample of United States publicly traded firms from 1973-2002, and considering the company's stage as a function of RE/TE and RE/TA, concluded there is in fact a relation, as dividends are higher when RE/TE is higher and low otherwise. Dennis et al. (2008), in their sample from US, UK, Canada, Germany, France and Japan companies from Worldscope in the period 1989-2002, concluded dividends were affected by firm size, profitability, growth opportunities, earned/contributed equity mix, which seemed to agree with the Life-cycle hypothesis. Desmukh et al. (2013) also found evidence of this on their study, particularly about profitability, as reduction in dividend payment was smaller in higher-growth firms. Kajola et al. (2015), with a study from Nigerian companies also seem to agree with the life-cycle hypothesis, by finding some relations between the firm characteristics and pay-out decisions, particularly a strong positive one with firm size, leverage and profitability.

d) Managerial preferences

The final aspect the authors consider is the managerial preferences about dividend policies. As we stated before, managers seem to have a preference for a stabilization policy, as they perceive either a decrease or increase would have an effect on the stock price (although short-termed, according to evidence collected). Managers would prefer then to smooth their dividends, as in Bremberger et al. (2016), in their sample of 106 firms publicly listed firms from seventeen European countries operating the electricity

market: they found evidence that incentive regulated firms smooth their dividends less than cost-based regulated firms and report higher target pay-out ratios; they also concluded lower smoothing is due to private firms while target pay-out is higher within state-controlled firms. We can also refer here to the study on CEO overconfidence by Desmukh et al. (2013), as an overconfident CEO would pay fewer dividends.

In conclusion, most literature researchers would agree with Baker et al. (2002) and Fama et al. (1968), as all these factors would influence companies' dividend policies, which would make it mathematically impossible to create a model for all firms at all times. This way, it is important to weigh these factors in the establishment of a dividend policy in further studies.

3. Hypothesis, Methodology and Data

3.1. Hypothesis

As stated before, the goal of this dissertation is to study if there is a change in dividend policies after the buyout by a PE firm. It was not to this point (to our knowledge) analysed by other researchers, and therefore we have no predictions in regard to literature. However, it would make sense for the dividends to increase in case the firm managers want to raise money for their investors early in the process; if their goal is to reach a high sale value, they will reduce their dividends so that the Equity value is higher at the time of the sale.

Thus, the hypotheses in this study are:

H_0: Dividend policies remain the same after the buyout by a PE firm.

H_1: Dividend policies change after the buyout by a PE firm.

3.2. Methodology

The methodology we will use in this study is in line with most studies and past dissertations we analysed for this report. To do that analysis, as we have stated, we will use the period of three years before and after the buyout. For methodology purposes, we will use the mean of years t-3 to t-1 in relation to the buyout, and compare it with the changes in following t+1 to t+3 years. As with many other studies, the buyout year (year 0), since it has both ownerships, will be excluded from the analysis.

To do so, we developed a model, that analyses how dividends are affected by factors previously referred in the literature review, such as Size, Profitability, Capital Expenditures and Capital Structure, along with differences between the periods pre and post buyout. Therefore, our model will be as followed:

$$Dividends_i^t = \alpha_i^t + \beta_1 Pre/Post\ Dummy + \beta_2 LnSize_i^t + \beta_3 Profitability_i^t + \beta_4 Capital\ Structure_i^t + \beta_5 Capital\ Expenditures_i^t + \varepsilon_i^t$$

, where *i* is the target company and *t* the year of the data (from the average of -3 to -1, to 1, 2, 3.

For the variable Dividends, we will use the Pay-out ratio, calculated as followed:

$$Payout\ Ratio_i^t = \frac{Dividends_i^t}{Net\ Income_i^t} * 100$$

We will use a proxy for Dividends, since the database does not present data on that level. Therefore, the Dividends will be calculated following the formula: $Total\ Dividends_i^t =$
$Other\ Shareholder\ Funds_i^{t-1} + Net\ Income_i^t - Other\ Shareholder\ Funds_i^t$.

For the variable Size, a natural logarithm of the Total Assets will be used. To compute the other variables, we will respectively use the ratios given by the following expressions:

$$Profitability: ROE_i^t = \frac{EBIT_i^t}{Total\ Equity_i^t};\quad Profitability: ROA_i^t = \frac{EBIT_i^t}{Total\ Assets_i^t}$$

$$Capital\ Structure_i^t = \frac{Total\ Equity_i^t}{Total\ Assets_i^t}\ ;\ Capital\ Expenditures_i^t = \frac{CAPEX_i^t}{Total\ Assets_i^t}$$

To calculate the CAPEX variable, since there is no value for it on the database, a proxy will also be used. We will only consider expansionary CAPEX, because it is what the company actually invest to improve its productivity.

$CAPEX_i^t = Fixed\ Assets_i^t - Fixed\ Assets_i^{t-1}$.

There will be also used a dummy variable to differentiate between the periods before and after the buy-out (1 if post, 0 if pre), while the ε_i represents the error.

We will proceed with two different analyses: the Univariate analysis, where we will observe the difference of both mean and median between pre/post-buyout years and their significance; the Multivariate analysis, where we made a regression analysis to our model, along with the corresponding F-Statistics for global significance of the model.

3.3. Sample Selection

In this dissertation we analysed the changes in dividend policies after the buyout by a PE firm in European countries. To do so, we used the Zephyr database, to find data on the buyouts that happened between the years 2010 and 2013, from the Private Equity tab, following the criteria Eastern and Western Europe for Geography selection. From this database we collected the sample of buyouts to analyse further.

To complete the data, we got from Amadeus database the remainder of the financial data and indicators, mostly regarding to the dividend pay-out, capital structure, size and

operating performance. The sample would register the period of three years before and after the buyout, as the database has information only on 10 years for each company.

The first sample, taken from Zephyr, had 3091 buyouts, following the criteria previously referred. However, some of the companies had to still be taken out of this sample. For starters, we only considered buyouts where the acquirer had a majority stake (>50%), since only then they would have enough power to change dividend policies. We also only considered targets from Europe, independent on the acquirer's country. Finally, some sub-types of deals had to be taken out, like every kind of exit and secondary or tertiary buyout, as it is not of interest to this study the difference between dividend policies when the company is held by different PE firms.

With these final restrictions, we started collecting the data from Amadeus. However, data in some of the companies was impossible to find, as some of the companies from the first sample did not exist on Amadeus, or their data was incomplete (we also eliminated companies where Equity < 0, due to continuity issues) – thus, we ended up with a sample of 307 buyouts from the period 2010-1013, where the target is in a European country.

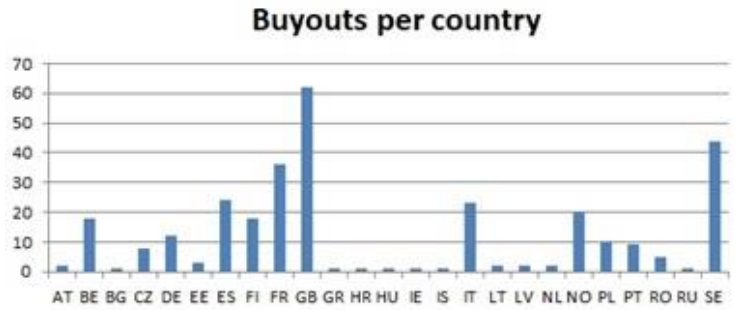
From this sample, some of the companies only had data in 2 or 1 years before the buyout, but since we will be doing an average of the years -3 to -1, they will still be a part of the study. However, tests with only the companies with complete data will also be done.

3.4. Sample Description

The next table and graph reflect how the sample is distributed, both by year and country.

Year	N
2010	92
2011	79
2012	61
2013	75
Total	307

Table 1 – Buyouts per buyout year



Graph 1 – Buyouts per country

As we can see, with the data we could retrieve from both Databases, 2010 is the year with most buyouts in our sample, looking at Graph 1. If we consider Graph 2, we can see that most buyouts come from Scandinavian countries, the United Kingdom or Central/Southern European countries such as Spain, France, Belgium and Italy; although in the first sample of buyouts there were many buyouts referring for example to Germany and Netherlands, but the information on those companies in the Database was not sufficient to enter this sample.

The following tables refer to the descriptive statistics on each variable referring to the year preceding/following the buyout.

Variable at average between years -3 and -1

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	50.12%	36.48%	31072.73%	-31216.57%	2561.32%	307
Size	9.59	9.52	14.68	4.09	1.48	307
ROA	12.54%	9.95%	81.38%	-112.22%	16.97%	307
ROE	48.77%	26.32%	1525.81%	-308.10%	139.86%	307
Cap. Str.	44.12%	44.32%	96.29%	0.41%	22.24%	307
CAPEX	4.18%	1.15%	62.74%	0	7.50%	307

Variable at year 1

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	-24.02%	9.98%	7785.59%	-36897.42%	2258.74%	307
Size	9.86	9.78	14.52	4.37	1.45	307
ROA	10.70%	7.00%	126.52%	-83.66%	19.70%	307
ROE	31.89%	22.59%	1316.47%	-1277.00%	158.09%	307
Cap. Str.	40.92%	38.37%	99.87%	1.60%	21.80%	307
CAPEX	7.04%	0.61%	85.39%	0	14.67%	307

Variable at year 2						
	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	141.92%	12.54%	7619.48%	-1976.18%	630.44%	307
Size	9.93	9.88	14.62	4.52	1.48	307
ROA	9.63%	7.87%	92.91%	-48.93%	16.47%	307
ROE	29.41%	19.53%	755.83%	-690.31%	98.33%	307
Cap. Str.	41.22%	39.09%	99.77%	1.86%	21.93%	307
CAPEX	4.55%	0.67%	91.01%	0	9.63%	307
Variable at year 3						
	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	-741.33%	0	106214.4%	-362518.1%	21594.45%	307
Size	9.97	9.91	14.70	5.05	1.48	307
ROA	9.77%	6.15%	268.35%	-62.11%	23.64%	307
ROE	16.46%	16.46%	1685.02%	-1358.78%	169.40%	307
Cap. Str.	41.15%	39.25%	99.62%	0.55%	23.32%	307
CAPEX	3.46%	0	78.27%	0	8.97%	307

Table 2 – Descriptive statistics by variable and year pre/post-buyout

As we can see, the variable related to the dividends, the Payout Ratio, has a positive mean for the the years before and the second year after, while the first year after the buyout is negative; however, in the 3rd year after the buyout, the mean gets more negative, with a value around -741% - we can see that in years after the buyout the Pay-out ratio is higher than 100% or negative, meaning the company is not really considering their period results in dividend payments. The median keeps decreasing from around 40% to 0. Regarding the volatility, we can watch the standard deviation remaining stable between the years before and the first after the buyout – despite this, it decreases in the 2nd year and increases exponentially in the 3rd, to 21594%. We can watch in the 3rd year the biggest difference between the maximum and minimum.

The size is increasing progressively through the years, both in the mean and the median – the volatility remains consistent, only suffering a slight decrease in the 1st year after the buyout.

Regarding profitability, we can observe a slight decrease in terms of ROA, going to values around 10% in the mean and 7% in the median, while the standard deviation is around 20%. We can also look at ROE, which has a more evident decrease, both in terms of mean and median. However, in this case, the volatility is way higher, as the

standard deviation is sometimes even higher than 100%, and the big difference between maximum and minimum values.

The capital structure suffered only a slight decrease, going to values around 40% after the buyout in both mean and median, while the volatility maintains its values around 20%.

As for the CAPEX, it also shows decrease in its values throughout time after the buyout, both in mean and median – the median in the 3rd year is even 0, meaning the investment is slowing down throughhout the years after the buyout. The volatility increased during the 1st year after the buyout, but ended up decreasing in the following years, fininshing in the 3rd year with values closer to the period before the buyout.

We have also to refer the presence of outliers in most of the variables, which we can easily observe by the great difference from the median to the Maximums and Minimums. Thus, when we are doing our regression, we will have to use some methods to reduce the influence of these outliers.

4. Empirical Results

4.1. Univariate Analysis

We started by gathering the change in mean and median in our variables between the years before the buyout and each year after. We tested for the significance of these changes using respectively the T-test and the Wilcoxon signed rank test. The results of this analysis are shown in the following table.

Variable	t-1…t+1	t-1…t+2	t-1…t+3
Dividends (p.p.)	-74.1408 (-26.5005)	91.8070 (-23.9411)	-791.4453 (-36.4781)***
ROA (p.p.)	-1.8398 (-2.9416)**	-2.9138** (-2.0722)***	-2.7652* (-3.7973)***
ROE (p.p.)	-16.8885 (-3.7233)***	-19.3649** (-6.7825)**	-32.3180** (-9.6782)***
Size	0.2699** (0.2574)**	0.3390*** (0.3641)***	0.3732*** (0.3901)***
CAPEX (p.p.)	2.8561*** (-0.5430)**	0.3668 (-0.4856)*	-0.7182 (-1.1515)***
Capital Structure (p.p.)	-3.1977* (-5.9531)*	-2.8924 (-5.2290)*	-2.9670 (-5.0742)*
N	307	307	307

Table 3 – Changes in Mean and Median (in parenthesis) between pre/post-buyout years. Significance tests to changes done by T-test and Wilcoxon signed rank test. *, ** and * represent the significance level at respectively 10, 5 and 1%.**

As we can see on the table, the difference between the means in the variable Dividends only reaches values higher than 100 p.p. (or lower than -100 p.p.) in the 3rd year, but this decrease is not statistically significant. In terms of median, there is a decrease comparing all years after the buyout with the years before. However, it is not as big as the one with the mean in the 3rd year, which can mean we are in the presence of outliers – the change in median is also statistically significant in year t+3 at a 1% level. Both profitability measures register negative changes, relatively similar in ROA but in ROE the mean decrease is much higher than the median one. Despite this, we can notice significance in the difference particularly in the 3rd year in both mean and

median. The variable size also increases in both measures, gaining significance as the years after the buyout go by.

Capital Structure and CAPEX have significant difference in medians, but only in the 1st years in mean – despite this, while the signal of the change is the same in Capital Structure, in CAPEX is only the same in the 3rd year after the buyout.

4.2. Multivariate Analysis

We continued our study by doing a regression analysis to our model, which we showed before. We used two measures for profitability, ROA and ROE, so we estimated the model with each variable. We used the OLS method. The following table shows the results of our regression. We had to use the Winsorize method in order to reduce the influence of the outliers, at a 99% level. There was also heteroscedasticity, which we found using the White test, and corrected using the Newey-West method. We also used the Wald Test to understand the global significance of the model, showed by the significance of the F-Stat.

Model 1 is our original model. We then used the Wald Test to understand the global significance of the model, showed by the significance of the F-Stat – thus we proceeded with eliminating the controlling variable with higher p-value in each model (as we can see in appendixes 3 and 4). We tested this using both measures of Profitability (in the Model 5 there is no distinction since profitability is no longer a variable in it).

As we can observe in the table, it seems ROE is the best choice for a profitability measure in this model – there is a really significant relation between it and the Dividends variable; the model is globally significant at a 1% level and the adjusted R^2 is never negative.

We can also observe a positive relation between pre and post-buyout years in terms of pay-out ratio, although not statistically significant. Most of the variables in this sample do not have statistical significance – the only statistically significant one is Profitability, as we said before, especially with ROE. We also have to note the really low R^2, below 1%, and although the model is globally significant (with ROE), this can be because of the strong relation between the variables Dividends and Profitability, as the others do not have statistical significance.

Variable	Model #								
	1		2		3		4		5
	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE	
Pre/Post Dummy	45.0681	48.9237	43.5170	45.9574	42.6797	44.9767	46.7420	49.0002	43.6158
Intercept	-127.3297	-139.5577	-85.9775	-76.6212	-82.8704	-72.5780	48.6973	48.2893	62.4596*
Profitability	106.5177	34.9080***	116.9342*	32.2890***	119.5272*	32.1084***	107.9080*	31.7632***	-
Size	15.6766	15.4224	14.6281	13.7447	13.5541	12.5775	-	-	-
CAPEX	-159.7806	-166.4374	-164.3482	-173.1923	-	-	-	-	-
Capital Structure	73.4903	102.8559	-	-	-	-	-	-	-
R^2	0.0039	0.0062	0.0032	0.0050	0.0026	0.0043	0.0017	0.0035	0.0008
Adjusted R^2	-0.0002	0.0022	-0.0000	0.0018	0.0001	0.0019	0.0000	0.0019	0.0000
F-Stat	1.8341	5.5510***	1.4702	4.8192***	1.6466	6.1651***	1.8502	8.680***	1.0773
N	1228	1228	1228	1228	1228	1228	1228	1228	1228

Table 4 – Multivariate analysis on model regression. Statistical significance of the coefficients given by *, **, *** that respectively represent 10, 5 and 1% levels.

4.3. Robustness Tests

4.3.1. Sample description

We have two sub-samples in this study. In the first one, we only use the companies whose data is complete – meaning, the ones who have values for all variables in all 6 years considered in this study. The second one registers a change in some of the variables: The ROA and the ROE are calculated now using EBITDA instead of EBIT; while instead of using expansionary CAPEX, we use the whole CAPEX, following the formula:

$$CAPEX_i^t =$$

$$Fixed\ Assets_i^t - Fixed\ Assets_i^{t-1} + Depreciations\ and\ Amortizations_i^t$$

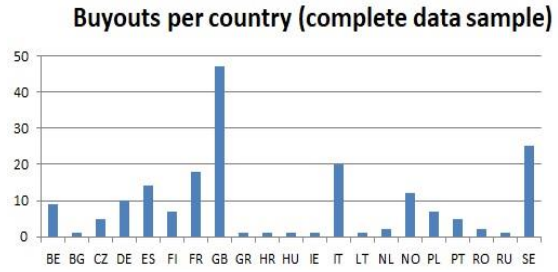
In the next tables and graphs, we can see how these samples are distributed by year and country:

Year	N
2010	9
2011	54
2012	56
2013	71
Total	190

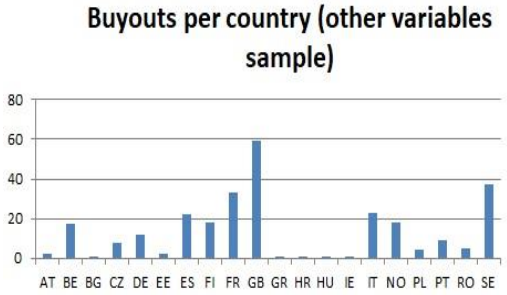
Table 5 – Buyouts per year in complete data sample

Year	N
2010	80
2011	69
2012	58
2013	67
Total	274

Table 6 - Buyouts per year in other variables sample



Graph 2 – Buyouts per country in complete data sample



Graph 3 – Buyouts per country in other variables sample

As we can see, the second sub-sample only has 33 companies less than the original one, and the data either by year or country remains practically the same. However, in the first one, with less 117 companies, the case changes a bit. 2010 was the year in both other samples with more buyouts, but here it only has 9. This can be explained with the fact the database only registers 10 years of information, so since we use a proxy for the values of dividends and CAPEX we would need data from the year t-4, which is hard to find for companies with the buyout in 2010. Thus, 2013 is the year with most buyouts. In terms of the distribution per country, it remains relatively similar.

We also computed the descriptive statistics of these sub-samples, whose tables can be consulted in the appendix.

As we can see, regarding the other variables sample, since it is relatively similar to the original one, its descriptive statistics did not change much. We can see the big decrease in the pay-out ratio in the last year of the sample, the slow growth on the companies' size and the decrease in profitability (ROA). However, in terms of ROE, the values increase comparing year t+3 with t+1 and t+2, while not reaching the values of before the buyout. The equity percentage relative to assets also decreases, like before; while the CAPEX increases in the first two years after the buyout, returning to normal values on the third.

The other sample registers greater differences. Starting with the dividends, contrary to the other samples, they tend to increase in terms of mean; in median, however, they decrease after the buyout, while not assuming negative values. The size continues its tendency to slowly increase, while the profitability indicators decrease after the buyout. The equity percentage of the company also decreases like before, although not by as much as in the other samples. The CAPEX only registers an increase in the first year after the buyout, returning then to the values of before. The volatilities of all variables remain relatively in line with the ones from the other samples.

4.3.2. Univariate Analysis

Like in section 4.1, we analysed the significance of the changes in the means and medians of both sub-samples using the T-test and Wilcoxon signed rank test. The results are shown in the following tables.

Variable	t-1…t+1	t-1…t+2	t-1…t+3
Dividends (p.p.)	32.0467 (-31.3802)	58.7356 (-36.5633)	582.1818 (-36.5633)***
ROA (p.p.)	0.6649 (-1.6781)	-2.3330 (-1.5995)**	-2.2335 (-3.2701)***
ROE (p.p.)	-16.1230 (-4.3769)	-22.2921 (-4.3399)*	-32.3098* (-9.5291)***
Size	0.2752* (0.1954)*	0.3356** (0.2871)*	0.3913** (0.3330)***
CAPEX (p.p.)	1.8327 (-0.8913)***	-0.6392 (-0.6897)***	-0.6994 (-1.3292)***
Capital Structure (p.p.)	-2.8975 (-5.3511)	-2.4876 (-4.1197)	-3.0590 (-4.0933)
N	190	190	190

Table 7 - Changes in Mean and Median (in parenthesis) between pre/post-buyout years, in complete data sample. Significance tests to changes done by T-test and Wilcoxon signed rank test. *, ** and *** represent the significance level at respectively 10, 5 and 1%.

We can see some differences between this and the original sample. For starters, in Dividends, although the medians remain similar, the means become now increasingly positive – despite this, there is only statistical significance in the median change in the 3rd year after the buyout.

The Profitability ratios behave similarly to the original sample, despite a positive value on the change in the 1st year – however, the significance is smaller, especially in the first two years. Size, like before, has a positive evolution in both measures, along with a higher significance level as the years after the buyout go by; Capital Structure has also a similar behaviour, despite not having significant differences in both mean and median. CAPEX also follows a similar evolution, with high significance in terms of median.

Variable	t-1…t+1	t-1…t+2	t-1…t+3
Dividends (p.p.)	-99.9709 (-36.5775)**	68.2275 (-33.9349)	-897.5492 (-36.7719)***
ROA (p.p.)	-2.0694 (-2.7416)**	-3.5066** (-2.7043)***	-3.4871** (-4.1892)***
ROE (p.p.)	-42.0835 (-2.3228)	-46.2129 (-6.0084)**	-37.8799 (-8.2805)
Size	0.2722** (0.2507)**	0.3462*** (0.3431)***	0.3834*** (0.3729)***
CAPEX (p.p.)	1.1651 (-1.0357)**	2.4067** (-0.8969)	0.4797 (-1.3770)*
Capital Structure (p.p.)	-3.6107** (-5.3331)*	-3.3991* (-5.5372)*	-3.4826* (-3.9683)**
N	274	274	274

Table 8 - Changes in Mean and Median (in parenthesis) between pre/post-buyout years, in other variables sample. Significance tests to changes done by T-test and Wilcoxon signed rank test. *, ** and * represent the significance level at respectively 10, 5 and 1%.**

This sample is more similar to our original one. Starting with Dividends, there is a comparable evolution between the years before and after the buyout – however, in this sample we find significant differences not only in year t+3, but also in t+1, in terms of median.

The Profitability variables have also a similar evolution, despite differences in ROE not being as statistically significant as in the other samples; while Size and Capital Structure maintain the similarities in their evolution with the original sample – only in this sub-sample the changes in Capital Structure have statistical significance.

As for CAPEX, despite showing also a similar evolution to the original sample, we can observe that the changes are only significant in the 1st and 3rd years in terms of median; and in the 2nd year in terms of mean.

4.3.3. Multivariate Analysis

We also tested the regression of our model in these two samples. Just like with the original sample, we had to use the Winsorize method to reduce the influence of the outliers; the test for heteroscedasticity came also positive, so we had to use again the Newey-West method to correct the values. The Wald test procedure for global significance was also repeated in the same way we did in the original sample.

As we can see in the tables, there is not much difference in terms of our main variable, the Pre/Post dummy, as the coefficients are similar. However, they still do not have statistical significance.

We can still watch the positive relation between the pay-out ratio and our variables for Profitability and Size, which seems according to the literature. We have here to highlight the high significance level of the Profitability variable, whereas the Size only has statistical significance in the other variables sample.

The CAPEX variable gains significance in both these samples, with a negative signal, while Capital remains statistically insignificant.

The two samples still remain with the main problem of the last one – the Adjusted R^2 remains too small, lower than 1% (although a bit higher). Here the complete data sample with ROE in the model remains the best alternative, while in the other one the R^2 for the models with ROA is higher. It is also important to refer that the models in both sample have global significance, as given by the F-Statistic.

Comparing the results in all samples we can understand the model with ROE is superior to the one with ROA; and that the other variables seem to work better with the model. However, the problems with R^2 continue, and it can only be improved with better data on the variables.

Variable	Model #								
	1		2		3		4		5
	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE	
Pre/Post Dummy	44.0576	47.4560	43.7340	46.1807	44.2105	46.6176	44.3913	46.4096	40.8914
Intercept	19.5007	12.8738	29.9469	45.5803	34.4425	50.8186	40.0186	44.7060	57.8288*
Profitability	143.7488**	29.8579***	145.9127**	28.8614***	149.4191***	28.9999***	149.0733***	29.0054***	-
Size	2.6707	2.2160	2.3504	1.2071	0.5719	-0.6314	-	-	-
CAPEX	-258.6586**	-263.8491**	-257.9139**	-261.9957**	-	-	-	-	-
Capital Structure	17.0288	50.3299	-	-	-	-	-	-	-
R^2	0.0058	0.0079	0.0058	0.0076	0.0035	0.0052	0.0035	0.0052	0.0010
Adjusted R^2	-0.0007	0.0014	0.0005	0.0023	-0.0005	0.0012	0.0008	0.0025	-0.0003
F-Stat	3.9301***	4.7661***	3.4497***	3.9211**	0.8811	3.3158**	1.3225	4.9833***	0.8830
N	760	760	760	760	760	760	760	760	760

Table 9 - Multivariate analysis on model regression, complete data sample. Statistical significance of the coefficients given by *, **, *** that respectively represent 10, 5 and 1% levels.

Variable	Model #								
	1		2		3		4		5
	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE	
Pre/Post Dummy	29.6478	31.1540	30.7982	30.1747	29.0290	28.1726	35.9030	34.9084	29.6745
Intercept	-178.8470*	-179.3156*	-205.4399**	-163.0698	-208.9028**	-164.7224	186.4365***	33.8747	55.4333**
Profitability	216.6579***	35.7168***	205.6856***	34.0639***	212.6266***	34.5355***	23.0764	34.3586***	-
Size	23.8600**	22.0700**	24.5069**	21.6600**	23.5886**	20.5862**	-	-	-
CAPEX	-180.6258*	-182.9534*	-176.3223*	-185.8025*	-	-	-	-	-
Capital Structure	-50.8404	25.6093	-	-	-	-	-	-	-
R^2	0.0091	0.0087	0.0087	0.0086	0.0073	0.0070	0.0036	0.0042	0.0005
Adjusted R^2	0.0046	0.0041	0.0051	0.0050	0.0046	0.0043	0.0018	0.0023	-0.0004
F-Stat	3.6336***	3.3749***	4.5436***	3.7842***	4.7332***	4.1969***	4.7520***	4.6131**	0.9148
N	1096	1096	1096	1096	1096	1096	1096	1096	1096

Table 10 - Multivariate analysis on model regression, other variables sample. Statistical significance of the coefficients given by *, **, *** that respectively represent 10, 5 and 1% levels.

5. Conclusions

After our tests in the different samples we analysed in this study, we can take some conclusions about how the dividend policies work after a PE buyout, and how they are influenced by other variables within the firm.

In the beginning of this study we established our hypothesis: if the dividend policy of a company invested by a PE firm changes after the buyout. After our statistical analysis, we believe we have an answer for the research question.

In our regression, in all samples, we found a positive relation between pay-out ratio and our Pre/Post-buyout dummy, meaning that it seems to increase after the buyout – however, this relation is not statistically significant. If we look to our tests on the changes of means and medians, along with the descriptive statistics we can take different conclusions: there seems to be a decrease after the buyout in terms of both mean and median in all samples except the complete data one, which is also the smallest. If we analyse this with the descriptive statistics, we see that in most samples the 3rd year has a really negative value for the pay-out ratio in terms of mean. Our conclusion from this is that firms want to pay dividends to their investors, even when the results are also negative.

In terms of median, we see it getting closer to 0, which represents one of the major problems for this study – the use of a proxy for dividends. Through our equation to calculate this proxy for the Variable, it is natural that some values would be 0 for dividends – for example, if the Company increases Equity by any means except a capital increase with negative Net Income.

It is clear that not all companies behave this way, as the statistically significant negative relation with CAPEX in most samples indicates – if the company is expanding and investing, it is expected that dividend payments will decrease. Other control variables like Size and Profitability have also a significant positive relation with our Dividends variable, as it was expected by our research in the available literature on the subject.

We also have a big problem with the really low R^2, with the adjusted value being negative in some cases. To solve this, it would be necessary a better and bigger sample with more accurate information on the variables needed for this study.

In summary, we found that most companies seem to have a preference for increasing their dividends in the first years after the buyout, in order to reward their investors early in the process. However, despite being in a smaller scale, companies that prefer to invest on the business and reward investors with the sale value are also an important part of this sample.

As a final note, we wanted to address some of the problems we had in writing this study, and how we believe this study can be improved: first, as we stated before, the fact we use a proxy for Dividends (there is not even data on Retained Earnings, only OSF) limits our analysis, as we do not have the real values for the variables.

In second is the fact that we only had data on a sample of 307 buyouts from a sample of 3091, not even having information on all years before the buyout. Therefore, in order to improve this study, a bigger sample with information on all years and variables needed would be required – this would indeed be useful in increasing the R^2.

6. Appendix

Appendix 1 – Descriptive Statistics (complete data sample)

Variable at average between years -3 and -1

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	52.40%	36.56%	6439.90%	-3662.99%	563.96%	190
Size	9.67	9.64	14.68	4.09	1.54	190
ROA	11.67%	8.49%	81.38%	-112.22%	17.90%	190
ROE	48.16%	23.10%	1525.81%	-308.10%	161.48%	190
Cap. Str.	44.87%	44.45%	96.29%	2.27%	21.79%	190
CAPEX	4.77%	1.33%	62.74%	0	8.62%	190

Variable at year 1

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	84.45%	5.18%	4766.12%	-5538.70%	669.23%	190
Size	9.95	9.83	14.46	4.37	1.47	190
ROA	11.01%	6.81%	126.52%	-83.66%	20.55%	190
ROE	32.04%	18.72%	1316.47%	-1258.12%	155.55%	190
Cap. Str.	41.97%	39.10%	95.88%	1.94%	20.40%	190
CAPEX	6.60%	0.44%	85.40%	0	14.46%	190

Variable at year 2

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	111.14%	0	6199.28%	-1976.18%	539.34%	190
Size	10.01	9.93	14.56	4.52	1.51	190
ROA	9.34%	6.89%	92.91%	-48.93%	17.23%	190
ROE	25.87%	18.76%	638.84%	-690.31%	96.60%	190
Cap. Str.	42.38%	40.33%	97.37%	1.86%	20.90%	190
CAPEX	4.13%	0.64%	91.01%	0	9.37%	190

Variable at year 3

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	634.58%	0	106214.4%	-1555.59%	7742.39%	190
Size	10.06	9.97	14.49	5.44	1.50	190
ROA	9.44%	5.22%	268.35%	-62.11%	27.29%	190
ROE	15.85%	13.57%	1685.02%	-1046.28%	181.45%	190
Cap. Str.	41.81%	40.36%	97.96%	0.63%	22.88%	190
CAPEX	4.07%	0	78.27%	0	9.83%	190

Appendix 2 – Descriptive Statistics (other variables sample)

Variable at average between years -3 and -1

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	48.39%	36.77%	31072.73%	-31217.6%	2671.92%	274
Size	9.63	9.55	14.68	4.09	1.46	274
ROA	17.08%	15.03%	86.54%	-110.95%	17.22%	274
ROE	90.55%	38.57%	7978.01%	-253.90%	491.91%	274
Cap. Str.	43.25%	42.94%	91.59%	0.86%	21.27%	274
CAPEX	6.30%	3.80%	62.74%	0	8.31%	274

Variable at year 1

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	-51.58%	0.19%	7784.59%	-36897.4%	2387.37%	274
Size	9.91	9.80	14.52	4.37	1.41	274
ROA	15.01%	12.29%	130.83%	-82.37%	18.49%	274
ROE	48.47%	36.25%	881.65%	-663.26%	110.80%	274
Cap. Str.	39.64%	37.61%	93.97%	1.60%	20.67%	274
CAPEX	7.47%	2.76%	93.38%	0	12.86%	274

Variable at year 2

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	116.61%	2.84%	6199.28%	-1976.18%	482.10%	274
Size	9.98	9.89	14.62	4.52	1.44	274
ROA	13.57%	12.33%	101.89%	-42.44%	15.93%	274
ROE	44.34%	32.57%	783.90%	-473.91%	82.73%	274
Cap. Str.	39.85%	37.40%	92.70%	1.86%	20.74%	274
CAPEX	8.71%	2.90%	90.28%	0	15.25%	274

Variable at year 3

	Mean	Median	Maximum	Minimum	Std. Dev.	N
Dividends	-849.16%	0	106214.4%	-362518%	2285922%	274
Size	10.02	9.92	14.70	5.53	1.44	274
ROA	13.59%	10.84%	101.63%	55.11%	17.85%	274
ROE	52.67%	30.29%	2070.05%	-236.60%	162.31%	274
Cap. Str.	39.77%	38.97%	97.81%	0.55%	22.05%	274
CAPEX	6.78%	2.42%	99.69%	0	11.04%	274

Appendix 3 – Regression on Original Sample with ROA (complete model)

Dependent Variable: DIVI_Q
Method: Least Squares
Date: 09/14/18 Time: 16:22
Sample: 1 1228
Included observations: 1228
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 7.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DUMMY	45.06811	42.12147	1.069956	0.2849
ROA_Q	106.5177	68.28003	1.560012	0.1190
SZ_Q	15.67659	11.70732	1.339042	0.1808
CPX_Q	-159.7806	126.6811	-1.261282	0.2074
CS_Q	73.49032	88.62319	0.829245	0.4071
C	-127.3297	118.9582	-1.070374	0.2847

R-squared	0.003866	Mean dependent var	95.17142
Adjusted R-squared	-0.000210	S.D. dependent var	651.1002
S.E. of regression	651.1685	Akaike info criterion	15.80029
Sum squared resid	5.18E+08	Schwarz criterion	15.82527
Log likelihood	-9695.377	Hannan-Quinn criter.	15.80969
F-statistic	0.948545	Durbin-Watson stat	1.976277
Prob(F-statistic)	0.448511	Wald F-statistic	1.834129
Prob(Wald F-statistic)	0.103320		

Appendix 4 – Regression on Original Sample with ROE (complete model)

Dependent Variable: DIVI_Q
Method: Least Squares
Date: 09/14/18 Time: 16:22
Sample: 1 1228
Included observations: 1228
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 7.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DUMMY	48.92365	41.88312	1.168099	0.2430
ROE_Q	34.90803	7.136253	4.891647	0.0000
SZ_Q	15.42243	11.59167	1.330475	0.1836
CPX_Q	-166.4374	126.6485	-1.314168	0.1890
CS_Q	102.8559	85.72976	1.199769	0.2305
C	-139.5577	118.1889	-1.180802	0.2379

R-squared	0.006241	Mean dependent var	95.17142
Adjusted R-squared	0.002175	S.D. dependent var	651.1002
S.E. of regression	650.3916	Akaike info criterion	15.79790
Sum squared resid	5.17E+08	Schwarz criterion	15.82288
Log likelihood	-9693.911	Hannan-Quinn criter.	15.80730
F-statistic	1.534994	Durbin-Watson stat	1.972562
Prob(F-statistic)	0.175975	Wald F-statistic	5.550984
Prob(Wald F-statistic)	0.000046		

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